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species of fruits yielded an agreeable syrup, or sugar, in a certain proportion to the quantity employed.

That apples or pears, which have not thoroughly ripened, are not so good for making sugar, and they yield less of it, and of an inferior quality, than when they are ripe.

4. That sugar may be obtained from the pears called *Pillage*, but it is of an inferior quality and in less quantity than that from apples, supposing the two fruits taken in equal measure.

5. That apples, which are not thoroughly ripe should be well bruised, and then be left for 24 hours, in order that the saccharine principle may be developed by the incipient fermentation; they yielded by this method more sugar, and that of better quality.

6. These principles are equally applicable to pears..

7. That in order to procure apple sugar, which does not curdle milk, it is absolutely necessary to neutralize the acid; and that it requires 'bout a drachm (troy) of chalk powder for every quart of juice, and two drachms to absorb the same quantity of acid contained in pear juice, which shows that the latter juice contains more acid than the former.

8. That it is impossible to obtain apple juice, or pear juice sufficiently clear to make a clear well tasted syrup, without using some intermedium for its clarification; and that either whites of eggs, or charcoal (finely powdered) may be employed for that purpose.

9. That in order to obtain liquid sugar of good quality from apples and pears, the heat must be applied gently and carefully, observing in all points what has been remarked in the first and following experiments, and especially it must be recollected, that the syrup becomes brown towards the the end of the operation, and tastes of burned sugar, if it be too much heated.

10. That according to the fifth experiment and those that follow, a cwt. of apples yield nearly eighty-four pounds of juice; which juice being reduced to a syrup by the above processes, yields nearly twelve pounds of liquid sugar. So that from these data it follows, that upon a medium of several years the price of apples being 1.20 francs (1s. 1d.) the cwt. and calculating the charges of making the sugar at 0 40 franc (4d.) excellent sugar may be obtained for 3 or 4 sols (2d.) per lb.

In a note on the first experiment, it is observed, that as yet only a very small quantity of solid sugar has been obtained from apple-juice. Nearly twenty specimens have, however, been obtained, upon which experiments have just been made, in order to obtain, if possible, a larger quantity. And from this note it appears, that wherever sugar is mentioned in the above paper, liquid sugar or syrup must be understood.

Composition for Roofs; communicated by James Ferguson, esq. of Pitfour, who received it from Commissioner Graham, of the Excise-office, Edinburgh.

From communications to the Board of Agriculture.

1st. Three parts of chalk, pounded fine, and passed through a sieve of twenty four meshes to an inch, are to be put into a small wooden box or vessel. 2d Into the middle of the chalk put one part of the best vegetable tar (Swedish will not do); mix them thoroughly with a wooden shovel, the tar to be poured in gradually; when completely mixed put it into an iron boiler, which must be moderately and gradually heated, stirring the composition to keep it from burning; after it has boiled for some time, dip in a lath, which is to be immediately cooled in water; if the composition on the lath is hard enough to resist the end of the finger, but yields to the nail, then it is ready to take the sand, which is to be prepared as follows:—Take the sharpest sand to be got, wash it if necessary, quite free from earth, and when dry pass it through a sieve of eight meshes to an inch; what passes is to be again sifted through one of sixteen meshes; that which does not pass is the coarse, or No. 1; sift again that which passed through sixteen, through one of thirty, and reject all the fine dust that passes; that which does not pass is fine sand, or No. 2. Mix these two kinds of sand in the proportion of five of No. 1, to two of No 2, and of this sand so mixed, take four parts; heat it well, either in a brick furnace or on an iron plate or boiler as above, stirring it very briskly all the while, so as to mix and incorporate the ingredients thoroughly, and prevent the sand from sinking to the bottom The composition being thus prepared is to be carried immediately to the place where it is to be laid on, in small light kettles, and spread even with trowels (like plasterers) made hot also, that it may not cool before the surface is made perfectly smooth: less nicety is required, when the whole is covered with earth.

The composition is to be laid on a flooring of rough boards, of three inches wide and three quarters of an inch thick, nailed as close as possible to the joists, hot, and about a quarter of an inch thick; and when cold, cover with another coat of the same thickness. A fall of one inch in ten feet is sufficient for these roofs. Over arches lay the composition rather thicker on a pavement of common tiles, made as flat as possible.

N. B. One barrel of tar and 45 stone of chalk, or whitening, will do thirty nine yards. The grate at Minto for heating the irons, or trowels, is twenty inches square by six inches deep, the peel twelve inches longer. A piece of strong sheet iron, four feet long, with the edges turned up about four inches, will do for drying the sand. Iron pots, about twenty Scotch pints, are of a convenient size; four of these built in, and used in succession, will keep two men employed in spreading the composition

Observation. The description of the instrument used for spreading the composition must be erroneous, as one so thin as a plasterer's trowel would retain heat too short a time to be of any use. Spreading the composition on boards does not appear to be of a good practice, as boards are so liable to shrink and expand, from the variations of the damp and dryness of the air, that the composition laid on them must be always full of cracks, caused by this circumstance. In many other respects as well as the above, the directions given before in this Magazine for this kind of roof (particularly those communicated by Mr. Bevans) are preferable to those of Mr. Graham; which are only inserted here, that the readers of this work may have a better opportunity of comparing them with those before given.

Description of a Machine for washing potatoes, and other esculent roots, invented by Mr. William Lester of Paddington. From Soc. Arts.

This machine consists of a barrel, or hollow cylindrical vessel, formed of two circular boards, with a number of staves connecting them, six of which are fastened at the ends to two pieces of wood so as to form a door, which is opened to put in or take out the potatoes. This cylinder has an axis passing through its centre, which is turned by a winch, and which has a small wheel or pulley put on each of its extremities, to admit of the cylinder being passed forwards and backwards along a frame, which turns on pivots, between two vessels, in such a manner that when one end of it is depressed, the cylinder rolls down over one of them, and when the other end is lowered, it passes back over the other; one of these vessels contains water, into which the cylinder is lowered by depressing the end of the frame next to it, and the potatoes are then washed by turning it round in the water; and when this operation is completed, the cylinder is made to come over the other vessel, into which the washed potatoes are deposited, by undrawing the bolts, which keep the door of the cylinder shut. The cylinder is again filled with potatoes, and the operation repeated until the whole quantity is washed One end of the frame extends much farther from the points on which it turns, than the other end, in order to serve as a lever for raising up the weight of the cylinder; the short end terminates in iron hooks, turning upwards and backwards towards the pivots, to prevent the cylinder from falling off; stops are also placed at this end, to prevent the other end from descending lower than